Austin Central Library & Related Improvements

Submittal Packages

Detailed Tracking Form

Project # 7010091
710 W. Cesar Chavez
Austin, Texas 78701

Jobsite Info.
Tel: 512.834.9848
Fax: 512.834.9844

Hensel Phelps

0003-07 21 00 (JV2)-0 **Polystyrene Foam Insulation (60 psi) Type VII - For Use Below Built-Up Slabs**

Submittal Author Company	Contact	Author Package #	Trade	Priority
Hensel Phelps	Ryan Freidberg		Thermal Insulation	High

Items

Item #	Reg #	Rev #	Spec Sec	Sub Sec	Description	Type	Action
0001	03675	0	07 21 00	2.1.A.3	Foam-Plastic Board Insulation (Type VII)	Product Data	

Reviewers

From Company	To Company	Sent Date	Due Date	Sent For
Hensel Phelps	City of Austin - Public Works Department	12/31/2014	01/14/2015	Approval

Package Notes:

HENSEL PHELPS CONSTRUCTION CO.

REVIEWED	☑	APPROVED	☐
REVISE & RESUBMIT	☐	APPROVED AS NOTED	☐
		REJECTED	☐

This submittal has been reviewed for general compliance with the contract documents. Approval does not relieve the subcontractor/supplier of the responsibility for conformance to the quality standards as set forth in the contract documents, nor does it relieve responsibility for field verification of all conditions relating to the work of the subcontractor/supplier. The subcontractor/supplier is responsible for dimensions and quantities of materials relating to this contract.

CK'D: RWF Date: 12/31/14

HPCC Submittal NO.: 0003-072100-0

Ryan Freidberg

Digitally signed by Ryan Freidberg
DN: C=US, E=Ryan.Freidberg@henselphelps.com, O=Hensel Phelps, OU=Office Engineer, CN=Ryan Freidberg
Reason: I have reviewed this document
Date: 2014.12.31 11:17:13-06'00'

LAKE/FLATO SHEPLEY BULFINCH.
A JOINT VENTURE

☐ Reviewed	☐ Furnish as Corrected
☑ Approved	☐ Revise and Resubmit
☐ Rejected	☐ Submit Specified Item

This review is only for general conformance with the design concept and the information given in the Construction Documents. Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with the requirements of the plans and specifications. Approval of a specific item shall not include approval of an assembly of which the item is a component. The contractor is responsible for: dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to the means methods, techniques, sequences and procedures of construction; coordination of the Work with that of all other trades and performing all Work in a safe and satisfactory manner.

Date 1/14/14

By Jonathan Smith

NOTES:

SPEC SECTION 07 21 00 (2.1)(A)(3)

FOAMULAR® 400/600/1000
Extruded Polystyrene (XPS) Rigid Foam Insulation

Product Data Sheet

Energy-Saving[1], Moisture-Resistant XPS Insulation

High Compressive Strength

FOAMULAR® 400 XPS Insulation: ASTM C578 Type VI, 40 psi minimum

✓ FOAMULAR® 600 XPS Insulation: ASTM C578 Type VII, 60 psi minimum

FOAMULAR® 1000 XPS Insulation: ASTM C578 Type V, 100 psi minimum

Description

✓ Owens Corning™ FOAMULAR® 400, 600 and 1000 are high strength Extruded Polystyrene (XPS) Insulation products designed for use in engineered applications requiring additional load-bearing capability such as under slab, concrete floors, foundations, roadways and rail beds, plaza and parking decks and cold storage installations.

The unique closed-cell structure of FOAMULAR® XPS Insulation helps to make it highly resistant to moisture, retaining its excellent R-value year after year—even following prolonged exposure to moisture and freeze/thaw cycling.

Key Features

- Designed for use in high load bearing applications. High compressive strength helps resist damage from heavy loads. Available in 40, 60 and 100 psi compressive strengths.
- Excellent long-term stable insulating performance with an R-value[2] of R-5 per inch.
- Exceptional moisture resistance, long-term durability.
- Limited lifetime warranty[3]—maintains 90% of R-value and covers all ASTM C578 properties.
- The only XPS foam to have achieved GREENGUARD Gold Certification.
- The only XPS foam with certified recycled content—certified by Scientific Certification Systems (SCS) to contain a minimum 20% recycled content.
- Will not corrode, rot or support mold growth.
- Zero ozone depletion potential with 70% less global warming potential than our previous formula.
- Reusable
- Lightweight, durable rigid foam panels are easy to handle and install.
- Easy to saw, cut or score.

Product Applications

- Owens Corning FOAMULAR® 400, 600, and 1000 Extruded Polystyrene (XPS) Rigid Foam Insulation are great for under slab, cold storage installations, concrete floors, foundations, plaza and parking decks, roofing, roadways and rail beds, permafrost protection and other high load-bearing applications
- Designed for use in high load bearing applications. High compressive strength resists damage from heavy loads. Available in 40, 60, and 100 psi compressive strengths

Technical Information

This product is combustible. A protective barrier or thermal barrier is required as specified in the appropriate building code. For additional information, consult MSDS or contact Owens Corning World Headquarters at 1-800-GET-PINK®.

All construction should be evaluated for the necessity to provide vapor retarders. See current ASHRAE Handbook of Fundamentals.

FOAMULAR® XPS Insulation is a non-structural material and must be installed on framing which is independently braced and structurally adequate to meet required construction and service loading conditions.

FOAMULAR® XPS Insulation can be exposed to the exterior during normal construction cycles. During that time some fading of color may begin due to UV exposure, and, if exposed for extended periods of time, some

1 Savings vary. Find out why in the seller's fact sheet on R-values. Higher R-values mean greater insulating power.

2 R means the resistance to heat flow; the higher the R-value, the greater the insulating power.

3 See actual warranty for complete details, limitations and requirements.

FOAMULAR® 400/600/1000
Extruded Polystyrene (XPS) Rigid Foam Insulation

Product Data Sheet

degradation or "dusting" of the polystyrene surface may begin. It is best if the product is covered within 60 days to minimize degradation. Once covered, the deterioration stops, and damage is limited to the thin top surface layers of cells. Cells below are generally unharmed and still useful insulation.

FOAMULAR® Extruded Polystyrene Insulation has a maximum service temperature of 165°F. Taking simple precautions during construction can minimize the potential for heat related damage. Install only as much FOAMULAR® XPS Insulation as can be covered in the same day. For horizontal applications, always turn the print side down so the black print does not show to the sun which may at times act as a solar collector, raising the temperature of the foam under the print to an unacceptable level. Provide a final finish covering or temporary white opaque covering to avoid possible damage when dark (non-white) surfaces are used over FOAMULAR® XPS Insulation. Do not cover FOAMULAR® XPS Insulation either stored (factory wrapped or unwrapped), or partially installed, with dark colored (non-white), or clear (non-opaque) coverings and leave it exposed to the sun. Examples of such coverings include but are not limited to filter fabrics, membranes, temporary tarps, clear polyethylene, etc. If improperly covered, and exposed to the right combination of sun, time and temperature, FOAMULAR® XPS Insulation deformation damage may occur rapidly. See Owens Corning publication number 10015704, "Heat Build Up Due to Solar Exposure" for more information.

Typical Physical Properties[1]

FOAMULAR® 400/600/1000 Extruded Polystyrene (XPS) Rigid Foam Insulation

Property	Test Method[2]	FOAMULAR® Insulation 400	600	1000
Thermal Resistance[3], R-Value (180 day) minimum, hr•ft²•°F/Btu (RSI, °C•m²/W) @ 75°F (24°C) mean temperature	ASTM C518			
1" Thickness		5.0 (0.88)	5.0 (0.88)	—
1½" Thickness		—	7.5 (1.32)	7.5 (1.32)
2" Thickness		10.0 (1.76)	10.0 (1.76)	10.0 (1.76)
3" Thickness		15.0 (2.64)	15.0 (2.64)	15.0 (2.64)
@ 40°F (4.4°C) mean temperature				
1" Thickness		5.4 (0.95)	5.4 (0.95)	—
1½" Thickness		—	8.1 (1.43)	8.1 (1.43)
2" Thickness		10.8 (1.90)	10.8 (1.90)	10.8 (1.90)
3" Thickness		16.2 (2.85)	16.2 (2.85)	16.2 (2.85)
Long Term Thermal Resistance, LTTR-Value[3] minimum hr•ft²•°F/Btu (RSI, °C•m²/W) @ 75°F (24°C) mean temperature	CAN/ULC S770-03			
1" Thickness		5.0 (0.88)	5.0 (0.88)	—
1½" Thickness		—	7.8 (1.37)	7.8 (1.37)
2" Thickness		10.6 (1.87)	10.6 (1.87)	10.6 (1.87)
3" Thickness		16.2 (2.85)	16.2 (2.85)	16.2 (2.85)
Compressive Strength[4], minimum psi (kPa)	ASTM D1621	40 (276)	60 (414)	100 (689)
Flexural Strength[5], minimum psi (kPa)	ASTM C203	115 (793)	140 (965)	140 (965)
Water Absorption[6], maximum % by volume	ASTM C272	0.05	0.05	0.05
Water Vapor Permeance[7], maximum perm (ng/Pa•s•m²)	ASTM E96	1.1 (63)	1.1 (63)	1.1 (63)
Dimensional Stability, maximum % linear change	ASTM D2126	2.0	2.0	2.0
Flame Spread[8, 9]	ASTM E84	5	5 ✓	5
Smoke Developed[8, 9, 10]	ASTM E84	45-175	45-175 ✓	45-175
Oxygen Index[8], minimum % by volume	ASTM D2863	24	24	24
Service Temperature, maximum °F (°C)	—	165 (74)	165 (74) ✓	165 (74)
Linear Coefficient of Thermal Expansion, in/in/°F (m/m/°C)	ASTM E228	← 3.5 x 10^{-5} (6.3 x 10^{-5}) →		

1. Properties shown are representative values for 1" thick material, unless otherwise specified.
2. Modified as required to meet ASTM C578.
3. R means the resistance to heat flow; the higher the value, the greater the insulation power. This insulation must be installed properly to get the marked R-value. Follow the manufacturer's instructions carefully. If a manufacturer's fact sheet is not provided with the material shipment, request this and review it carefully. R-values vary depending on many factors including the mean temperature at which the test is conducted, and the age of the sample at the time of testing. Because rigid foam plastic insulation products are not all aged in accordance with the same standards, it is useful to publish comparison R-value data. The R-value for FOAMULAR® XPS Insulation is provided from testing at two mean temperatures, 40°F and 75°F, and from two aging (conditioning) techniques, 180 day real-time aged (as mandated by ASTM C578) and a method of accelerated aging sometimes called "Long Term Thermal Resistance" (LTTR) per CAN/ULC S770-03. The R-value at 180 day real-time age and 75°F mean temperature is commonly used to compare products and is the value printed on the product.
4. Values at yield or 10% deflection, whichever occurs first.
5. Value at yield or 5%, whichever occurs first.
6. Data ranges from 0.00 to value shown due to the level of precision of the test method.
7. Water vapor permeance decreases as thickness increases.
8. These laboratory tests are not intended to describe the hazards presented by this material under actual fire conditions.
9. Data from Underwriters Laboratories Inc.® classified. See Classification Certificate U-197.
10. ASTM E84 is thickness-dependent, therefore a range of values is given.

Standards, Codes Compliance

- Meets ASTM C578 Type VI (FOAMULAR® 400 XPS Insulation), Type VII (FOAMULAR® 600 XPS Insulation), or Type V (FOAMULAR® 1000 XPS Insulation).

FOAMULAR® 400/600/1000
Extruded Polystyrene (XPS) Rigid Foam Insulation

Product Data Sheet

Product and Packaging Data

FOAMULAR® 400/600/1000 Extruded Polystyrene (XPS) Rigid Foam Insulation

Material	Packaging
Extruded polystyrene closed-cell foam panel with continuous skin on face and back surface.	Shipped in poly-wrapped units with individually wrapped or banded bundles.

Thickness (in)	Product Dimensions Thickness (in) x Width (in) x Length (in)	Pallet (Unit) Dimensions (typical) Width (ft) x Length (ft) x Height (ft)	Square feet per Pallet	Board feet per Pallet	Bundles per Pallet	Pieces per Bundle	Pieces per Pallet	Edges
FOAMULAR® 400 XPS Insulation								
1	1 x 24 x 96	4 x 8 x 8	3,072	3,072	8	24	192	Square Edge
2	2 x 24 x 96	4 x 8 x 8	1,536	3,072	8	12	96	
	2 x 48 x 96	4 x 8 x 8	1,536	3,072	8	6	48	
3	3 x 24 x 96	4 x 8 x 8	1,024	3,072	8	8	64	
	3 x 48 x 96	4 x 8 x 8	1,024	3,072	8	4	32	
FOAMULAR® 600 XPS Insulation								
1	1 x 24 x 96	4 x 8 x 8	3,072	3,072	8	24	192	Square Edge
1½	1.5 x 24 x 96	4 x 8 x 8	2,048	3,072	8	16	128	
2	2 x 24 x 96	4 x 8 x 8	1,536	3,072	8	12	96	
	2 x 48 x 96	4 x 8 x 8	1,536	3,072	8	6	48	
3	3 x 24 x 96	4 x 8 x 8	1,024	3,072	8	8	64	
	3 x 48 x 96	4 x 8 x 8	1,024	3,072	8	4	32	
FOAMULAR® 1000 XPS Insulation								
1.5	1.5 x 24 x 96 (Half unit)	4 x 8 x 4	1,024	1,536	4	16	64	Square Edge
2	2 x 24 x 96 (Half unit)	4 x 8 x 4	768	1,536	4	12	48	

1. Product availability and lead times vary by region and by product. Consult your local Owens Corning sales representative for availability and lead times.

- UL Classified. A copy of UL Classification Certificate U-197 is available at www.owenscorning.com
- See ICC-ES Evaluation Report ESR-1061 at www.icc-es.org
- See www.foamular.com for details on listings, constructions and assemblies
- Meets California Quality Standards and HUD UM #71a
- Compliance verification by RADCO (AA-650)

Certifications and Sustainable Features of FOAMULAR® XPS Insulation

- FOAMULAR® XPS Insulation is reusable
- FOAMULAR® XPS Insulation is made with a zero ozone depletion formula
- Certified by Scientific Certification Systems to contain a minimum of 20% pre-consumer recycled polystyrene
- Certified to meet indoor air quality standards under the stringent GREENGUARD Certification Program and GREENGUARD Gold Certification Program
- Utilizing FOAMULAR® XPS Insulation can help achieve green building certifications including the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) certification

Environmental and Sustainability

Owens Corning is a worldwide leader in building material systems, insulation and composite solutions, delivering a broad range of high-quality products and services. Owens Corning is committed to driving sustainability by delivering solutions, transforming markets and enhancing lives. More information can be found at http://sustainability.owenscorning.com.

FOAMULAR® 400/600/1000
Extruded Polystyrene (XPS) Rigid Foam Insulation

Product Data Sheet

Warranty

FOAMULAR® XPS Insulation limited lifetime warranty maintains 90% of its R-value for the lifetime of the building and covers all ASTM C578 properties. See actual warranty for complete details, limitations and requirements at www.owenscorning.com.

All products described here may not be available in all geographic markets. Consult your local sales office representative for more information.

For more information on the Owens Corning family of building products, contact your Owens Corning dealer, call 1-800-GET-PINK®, or access www.owenscorning.com.

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Pub. No. 58307-H. Printed in U.S.A. December 2013.

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ICC-ES Evaluation Report

ESR-1061
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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 21 00—Thermal Insulation
Section: 07 25 00—Water-Resistive Barriers/Weather Barriers

REPORT HOLDER:

OWENS CORNING FOAM INSULATION, LLC
ONE OWENS CORNING PARKWAY
TOLEDO, OHIO 43659
(330) 677-2331
www.owenscorning.com

EVALUATION SUBJECT:

FOAMULAR® 150, 250, 400, 600, AND 1000 EXTRUDED POLYSTYRENE INSULATION BOARDS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2009 International Building Code® (IBC)
- 2009 International Residential Code® (IRC)
- 2009 International Energy Conservation Code® (IECC)
- Other Codes (see Section 8.0)

Properties evaluated:

- Physical properties
- Surface burning characteristics
- Thermal performance (R-values)
- Attic and crawl space installation
- Water-resistive barrier

2.0 USES

The FOAMULAR insulation boards described in Table 1 of this report are extruded polystyrene foam plastic insulation boards for use as nonstructural thermal insulation in wall assemblies, door cavities, in ceiling/floor assemblies and as a component of classified roof assemblies. The insulation boards may be used at the exterior perimeter of foundations, except in areas where the probability of termite exposure is "very heavy" as defined Section 2603.8 of the IBC and Section R318.4 of the IRC. The insulation may be used in any type of construction; see Section 4.4 for use on exterior walls of Types I, II, III and IV construction. The insulation boards may be used on walls, ceilings and floor surfaces of attics, crawl spaces, detached garages, pole barns, telecommunication shelters, concrete modular buildings, agricultural buildings, buildings regulated under IBC Section 312 (Utility and Miscellaneous, Group U), or structures constructed in accordance with the IBC or IRC, with no covering applied to the foam plastic, when the boards are installed in accordance with Section 4.2.

FOAMULAR insulation boards may be used as alternatives to the water-resistive barrier specified in the IBC and IRC, when installed as set forth in Section 4.3.

3.0 DESCRIPTION

3.1 General:

FOAMULAR insulation boards are extruded polystyrene (XPS) foam plastic complying with ASTM C 578 and having minimum densities as specified in footnote 1 of Table 1 of this report. The insulation boards are available in various densities having the product names listed in Table 1. The boards are available in various lengths and widths and in thicknesses up to 4 inches (102 mm) for Types X, IV, VI, VII and V, with various edge and surface configurations.

3.2 Joint-sealing Tape:

Owens Corning Propink Butyl Seam tape is nominally 3 inches (76.2 mm) wide and is used in conjunction with FOAMULAR brand insulation board products to seal joints between two or more edges of the boards, when the insulation boards are installed as a water-resistive barrier. The installation must be as described in Section 4.3 of this report.

3.3 Surface Burning Characteristics:

FOAMULAR insulation boards have a flame-spread index of 25 or less and a smoke-developed index of 450 or less, when tested in accordance with ASTM E 84 at a maximum thickness of 4 inches (102 mm) and a maximum density of 3.6 pcf (57.6 kg/m^3).

3.4 Thermal Resistance, (R-Values):

FOAMULAR insulation boards have a thermal resistance (R-value) at a mean temperature of 75°F (24°C) as shown in Table 1.

4.0 INSTALLATION

4.1 General:

FOAMULAR insulation boards must be installed in accordance with the manufacturer's published installation instructions and this report.

Except as described in Section 4.2, the interior of the building must be separated from the insulation boards by an approved 15-minute thermal barrier as required in IBC

Section 2603.4 or IRC Section R316.4 The use of the insulation boards in areas of "very heavy" termite probability must comply with IBC Section 2603.8, or IRC Section R318.4, as applicable. Under the IBC, protection against condensation must be provided in accordance with IBC Sections 1403.2 and 1405.3; under the IRC, when required, a vapor retarder must be provided in accordance with IRC Section R601.3. Except as described in Section 4.3, a water-resistive barrier must be provided in accordance with IBC Section 1404.2 or 2510.6 or IRC Sections R703.2 R703.6.3, as applicable.

FOAMULAR insulation boards must not be used as a nailing base for exterior siding materials. All nailing must penetrate through the boards into the wall framing or structural sheathing as required by the siding manufacturer's installation instructions or the applicable code. Fasteners used to attach finish material over insulation boards must comply with a current ICC-ES evaluation report for proprietary wall covering materials, or IBC Section 1405.17, or IRC Table 703.4, and the installation instructions from the finish manufacturer. For exterior wall covering applications, fasteners for insulation boards thicker than 1$^1/_2$ inches (38 mm) must be considered for lateral resistance to ensure support for the exterior wall coverings. Wall coverings over the insulation must be structurally adequate to resist the required horizontal forces perpendicular to the wall.

Exterior wall assembly, exterior finish or a wall covering in conjunction with insulation boards must be structurally adequate to resist horizontal forces perpendicular to the wall. All walls must be braced in accordance with IBC Sections 2308.9.3 and 2308.12.4, or IRC Section R602.10, as applicable.

FOAMULAR insulation boards must be installed in a manner which will hold the insulation securely in place.

4.2 Special Uses:

4.2.1 Attics and Crawl Spaces: FOAMULAR insulation boards may be used in attics and crawl spaces without a covering being applied to the interior side of the foam plastic, provided all of the following conditions are met:

a. Entry to the attic or crawl space is only to service utilities and no storage is permitted.

b. There are no interconnected attic or crawl space areas.

c. Air in the attic or crawl space is not circulated to other parts of the building.

d. Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806, as applicable. Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.3 or IRC Section R408.1, as applicable.

e. Combustion air is provided in accordance with Section 701 of the *International Mechanical Code*® (IMC).

f. FOAMULAR insulation boards are limited to a maximum density of 2.0 pcf (32 kg/m^3) and a maximum thickness of 3 inches (76.2 mm).

4.2.2 Other Structures: FOAMULAR insulation boards, with a maximum thickness of 3 inches (76 mm), may be installed on any or all surfaces (wall, ceiling, floor) of detached garages, pole barns, telecommunication shelters, concrete modular buildings, agricultural buildings, buildings under the IBC Utility and Miscellaneous Group U or other structures under the IBC or IRC, with no coverings (thermal or ignition barrier) applied to the foam plastics, when all other requirements of the building code for that building are met.

4.3 Water-resistive Barrier

When installed on exterior walls in accordance with this section, the FOAMULAR insulation boards may be used as an alternative to the water-resistive barrier as prescribed in IBC Section 1404.2 and IRC Section R703.2. The boards must be covered with an approved exterior wall covering.

FOAMULAR insulation boards measuring 2 feet by 8 feet (0.6 m by 2.4 m) or 4 feet by 8 feet (1.2 m by 2.4 m) are installed horizontally or vertically with long joints and end joints in contact with one another. When installed directly on framing members, the insulation boards measuring 2 feet by 8 feet (0.6 m by 2.4 m) must be installed horizontally and framing members are spaced a maximum of 16 inches on center. For wood framing, the insulation boards are attached using $^3/_8$-inch-diameter-head (9.5 mm) galvanized nails, 1-inch-crown (25.4 mm) galvanized staples, 6d ring-shank nails with 1-inch (25.4 mm) plastic washers or equivalent fasteners long enough to penetrate framing a minimum of $^3/_4$ inch (19 mm), or through the sheathing, whichever is less. For steel framing, the insulation boards are attached using No. 6, Type S drywall screws with 1-inch (25.4 mm) plastic washers, long enough to penetrate the framing a minimum of $^3/_4$ inch (19 mm). Fasteners must not be over-driven. Fasteners must be spaced a minimum of 12 inches on center around the perimeter and 16 inches on center in the field. For window installations, the nailing flange is set against sealant bedding and fastened to the framing with galvanized roofing nails 3 inches (76.2 mm) from each corner and 8 inches (203.2 mm) on center. Minimum 3-inch-wide (76.2 mm) flashing is used to seal the sills of windows, and minimum 2-inch-wide (50.8 mm) flashing is used to seal jambs and heads. Window installation must be in accordance with the window manufacturer's instructions. See also Figure 1.

Seams and joints between boards must be covered by minimum 3-inch-wide (76.2 mm) Propink Butyl Seam tape positioned using hand pressure, and finished with a roller. Penetrations in exterior walls must be sealed with a sealant complying with ASTM C 920, Type S or M, Grade NS, Class 25, or with expanding spray foam sealant complying with AAMA 812 as part of the penetration flashing procedure illustrated in Figure 1 and Figure 2.

When the insulation boards are applied over open framing, vertical butt joints must be over framing members. Horizontal joints of foam plastic boards must be tongue-and-groove, or supported by blocking. For cementitious exterior wall coating systems, unbacked joints are permitted only when specified in the ICC-ES evaluation report on the cementitious exterior wall coating system.

4.4 Use on Exterior Walls in Types I, II, III and IV Construction:

When used on walls of Types I, II, III and IV construction, the assembly in which the ASTM C 578 Type X, IV, VI, VII and V FOAMULAR foam plastic insulation is used, must comply with IBC Section 2603.5. The potential heat of the foam plastic insulation boards in any portion of the wall or panels must not exceed the potential heat, expressed in Btu/ft^2 (mJ/M^2), of the foam plastic insulation contained in the wall assembly tested in accordance with NFPA 285. The potential heat for the ASTM C 578 Type X, IV, VI, VII and V FOAMULAR foam plastic insulation boards is 1905, 2271, 2638, 3224, and 4396 Btu/ft^2 (21.6, 25.8, 30.0, 36.6 and 49.9 mJ/M^2) per inch of thickness, respectively.

5.0 CONDITIONS OF USE

The FOAMULAR foam plastic insulation boards described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The insulation boards must be installed in accordance with the manufacturer's published installation instructions, subject to the conditions of this report and the applicable code. In the event of a conflict between the manufacturer's instructions and this report, this report governs.

5.2 A water-resistive barrier complying with the requirements of the applicable code must be provided, except when installation is as described in Section 4.3 of this report.

5.3 Use of the insulation boards to structurally resist transverse, racking-shear or vertical loading is outside the scope of this report. Walls must be braced in accordance with the requirements of the applicable code.

5.4 The insulation boards must not be used as a nailing base for exterior siding materials. All nailing must be into the wall framing as required by the siding manufacturer's published installation instructions or the applicable code.

5.5 The insulation boards must be separated from the interior of the building with an approved 15-minute thermal barrier, except as described in Section 4.2 of this report.

5.6 Where required by the applicable code, a vapor retarder system, must be installed in the exterior wall, floor, and/or roof ceiling assembly.

5.7 Jobsite certification and labeling of the insulation must comply with IRC Section N1101.4 and IECC Section 303.1, as applicable.

5.8 Use of foam plastic insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with IBC Section 2603.8 or IRC Section R318.4, as applicable. In these areas, the clearance between the foam plastic insulation and exposed earth must be a minimum of 6 inches (152 mm).

5.9 When use is on buildings of Type I, II, III or IV construction, documentation must be submitted to the code official verifying that the insulation has been qualified as a component of an assembly tested in accordance with Sections 2603.5.1, 2603.5.5 and 2603.5.7 of the IBC. The maximum potential heat of the foam plastic used in the assembly must be no greater than that noted in Section 4.4.

5.10 FOAMULAR insulation boards are manufactured in Portland, Oregon; Grand Ile, Quebec; Tallmadge, Ohio; and Rockford, Illinois, under a quality control program with inspections by RADCO (AA-650).

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2009.

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Sheathing Panels Used as Water-resistive Barriers (AC71), dated February 2003 (editorially revised June 2008).

6.3 Reports of room corner fire tests in accordance with NFPA 286, for the special uses in Section 4.2

6.4 Reports of potential heat tests in accordance with NFPA 259.

7.0 IDENTIFICATION

FOAMULAR insulation boards must be identified by the Owens Corning name, the product name, the name of the inspection agency [RADCO (AA-650)], the plant code or manufacturing location address and the evaluation report number (ESR-1061).

Owens Corning Propink Buytl tape must be identified with the Owens Corning name, the product name and the evaluation number (ESR-1061)

8.0 OTHER CODES

In addition to the codes referenced in Section 1.0, the products described in this report were evaluated for compliance with the requirements of the following codes:

- 2006 *International Building Code*® (2006 IBC)
- 2006 *International Residential Code*® (2006 IRC)
- 2006 *International Energy Conservation Code*® (2006 IECC)

The products comply with the above-mentioned codes as described in Section 2.0 through 7.0 of this report, with the revisions noted below:

- **Uses:** See Section 2.0, except use of the insulation boards in areas of "very heavy" termite infestation is in accordance with 2006 IRC Section R320.5
- **Design and Installation:** See Section 4.1, except the interior of the building must be separated from the insulation boards with a thermal barrier complying with Section R314.4 of the 2006 IRC, and a vapor barrier must be installed in accordance with Section R318.1 of the 2006 IRC.
- **Special Uses: Attics and Crawl Spaces:** See Section 4.2, except combustion air is provided in accordance with Section 701 and 703 of the 2006 IMC.
- **Conditions of Use:** See Section 5.0, except:

  Under Section 5.7, jobsite certification and labeling must comply with 2006 IECC Section 102.1.1.

  Under Section 5.8, in areas where the probability of termite infestation is "very heavy," use of foam plastic must be in accordance with 2006 IRC Section R320.5.

TABLE 1—FOAMULAR INSULATION BOARDS

PRODUCT NAME	ASTM C 578 TYPE[1]	*R*-VALUE, *R* / INCH AT 75°F (ft²-hr-°F/Btu)
FOAMULAR 150	X	5.0
FOAMULAR 250	IV	5.0
FOAMULAR 400	VI	5.0
FOAMULAR 600	VII	5.0
FOAMULAR 1000	V	5.0
FOAMULAR INSULATING SHEATHING	X	5.0
FOAMULAR PROPINK	X	5.0
FOAMULAR HALF INCH	X	3.0 in 1/2-inch thickness
FOAMULAR INSULPINK	X	5.0
FOAMULAR INSULPINK Z	X	5.0
FOAMULAR CC	X	5.0
FOAMULAR CW15	X	5.0
FOAMULAR CW25	IV	5.0
FOAMULAR THERMAPINK 18	X	5.0
FOAMULAR THERMAPINK 25	IV	5.0
FOAMULAR THERMAPINK 40	VI	5.0
FOAMULAR THERMAPINK 60	VII	5.0
FOAMULAR C-200	X	5.0
FOAMULAR C-300	IV	5.0
FOAMULAR 350	IV	5.0
FOAMULAR 404	VI	5.0
FOAMULAR 604	VII	5.0
FOAMULAR 404RB	VI	5.0
FOAMULAR 604RB	VII	5.0
FOAMULAR DURAPINK	IV	5.0
FOAMULAR DURAPINK FA	IV	5.0
FOAMULAR DURAPINK PLUS	IV	5.0
FOAMULAR LT30	IV	5.0
FOAMULAR LT40	VI	5.0
FOAMULAR PINKCORE	IV	5.0
FOAMULAR AG-TEK	IV	5.0
FOAMULAR CC HIGH R	IV	5.6
FOAMULAR HIGH R CW PLUS	IV	5.6

For **SI:** 1 inch = 25.4 mm, 1 ft²-hr-°F/Btu = 0.176 m²-K/W, 1 pcf = kg/m³.

[1]Type X has a minimum density of 1.30 pcf; Type IV has a minimum density of 1.55 pcf;
[2]Type VI has a minimum density of 1.80 pcf; Type VII has a minimum density of 2.20 pcf;
[3]Type V has a minimum density of 3.00 pcf.

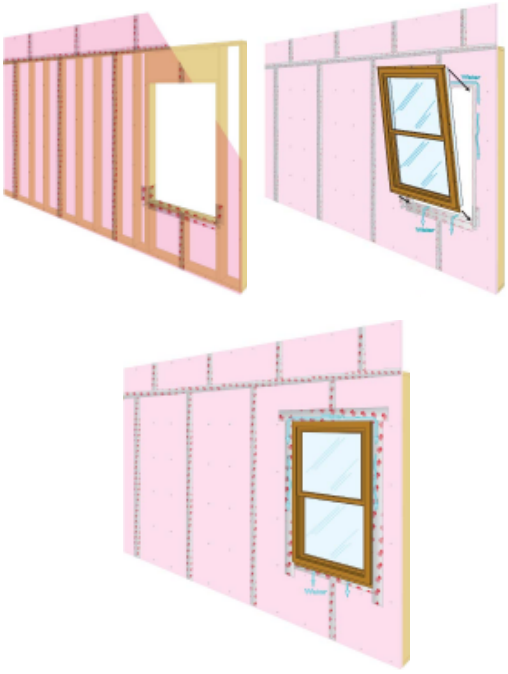

FIGURE 1—TYPICAL WINDOW FLASHING DETAIL

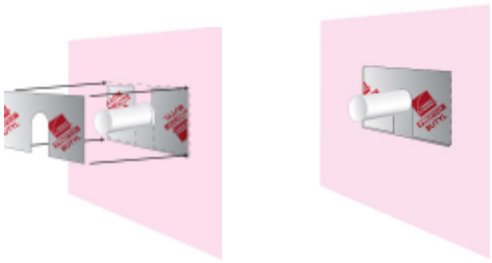

FIGURE 2—TYPICAL PENETRATION FLASHING DETAIL